

## **NCCN Draft Monitoring Protocol Summary**

### **Wildlife Workgroup**

#### **Title: Ungulate Monitoring (Two Objectives)**

**Parks:** OLYM, MORA, NOCA, FOCL

**Justification:** Ungulates are keystone species due to the pronounced effects of their herbivory and trampling on vegetation composition and structure, plant succession, nutrient cycling, and ecosystem processes. In addition, ungulates serve a key role as prey for large carnivores and scavengers. Hence, significant changes in ungulate populations, either increasing or decreasing, would affect many ecological, cultural and wilderness values of several NCCN parks. Information on trends of ungulate populations has important management significance in NCCN Parks due to its bearing on these park's abilities to arbitrate logging, hunting and predator control activities on the park's boundaries (and potentially within park boundaries in the future).

The remainder of this document is divided up by taxa--first elk, then goats.

#### **ELK**

There are several management issues and concerns regarding elk in National Parks of the NCCN (OLYM, MORA, FOCL) that require sound information on population trend:

- Olympic National Park is home to the largest protected herd of Roosevelt elk in its natural ecosystem—a unique resource that was instrumental in the Park's creation and that today represents one of the 'signature' resources for which the Park is renowned.
- Over several decades, there has been recurrent controversy regarding the ecological effects of overabundant elk on ecological integrity of subalpine meadows in Mount Rainier National Park and of lowland rainforest communities in Olympic National Park.
- Despite protection within National Parks, elk populations have declined by 40-60% in many areas adjoining these parks, and there are legitimate concerns that migratory subpopulations that leave the parks during autumn and resident herds that live along park boundaries may be subject to similar pressures (habitat deterioration due to forest succession, predation, and increased legal or illegal hunting).
- Substantial predator control activities adjacent to Mount Rainier National Park could result in negative impacts to predator populations. Reduction in predation is likely to promote population growth of elk inside the park and generate renewed concern over the ecological integrity of the Park's renowned subalpine meadows.
- There is persistent interest among local Native American tribes to reclaim hunting rights inside current boundaries of Olympic National Park. Up-to-date information on status and trends is likely to be important in future arbitrations.
- There have been recurring proposals to introduce wolves back to Olympic National park and hopes that wolves will naturally recolonize the Cascades from Canada. Up-

to-date information on status and trends of elk is needed to assess feasibility of wolf reintroduction.

- Nationally, the increased prevalence of wildlife diseases (e.g., chronic wasting disease, paratuberculosis, others) threatens ungulate populations and is a growing concern.
- Elk are a key component of FOCL's ecological and cultural resources. Due to the park's size, FOCL elk populations are highly dependent in management outside the park. Ongoing and impending land use and management changes will likely negatively impact the park's elk. Prior to monitoring, the park needs information on elk herd movement and distribution patterns, critical habitat, effects of outside landscape use changes, linkages for movements, and the consequent effects on the park's elk population. Once this information is gained, FOCL will need ongoing monitoring of 1) land use outside the park, and 2) elk numbers and use patterns inside the and adjacent to FOCL.

**Monitoring Objective 1:** Determine trends in abundance of **elk populations** inhabiting low-elevation winter ranges in Olympic National Park during spring, high-elevation summer ranges in MORA and OLYM, and using park and adjoining lands in FOCL.

*What environmental resource will be monitored (target population)?*

We propose to monitor trends in counts of elk observed during aerial surveys of low elevation floodplain forests during the spring in OLYM and high-elevation subalpine meadows during autumn in OLYM and MORA. Further, while under development, we propose road and aerial surveys of elk abundance in FOCL. Justification: OLYM and MORA have historical data from aerial surveys of these areas. The areas were chosen because elk herds are most visible during these times of the year in these habitats.

*What will be measured (i.e., specifically the measurable attribute)?*

Raw counts of elk observed from standard aerial survey protocols to include sex and age composition counts of elk on subalpine meadows at MORA and OLYM. We will consider modifying the protocol in the future to include adjustments for visibility biases once appropriate corrective models are developed.

*Where will it be monitored?*

Aerial surveys will be flown over (i.e, inference is limited to) low-elevation floodplain forests of the Hoh, South Fork Hoh, and Queets drainages in OLYM, high-elevation summer ranges of the North and South Rainier elk herds in MORA. These areas correspond with areas traditionally surveyed since the 1980's in each park and the most significant elk ranges in each park.

*How will it be measured?*

We will count all elk observed from a helicopter using helicopter survey methods that have been developed for OLYM and MORA. In OLYM low-country, we will conduct 3 replicate counts of elk between 15-30 March each year from a helicopter flying approximately 200m above ground in parallel transects over each survey area. In MORA and OLYM we will conduct 3 replicate counts of elk between 15-30 September each year

from a helicopter flying approximately 200m above ground in parallel transects over each survey area. We will need to develop monitoring protocols for FOCL.

*How frequently will it be monitored?*

In OLYM, one watershed will be surveyed each year, every other year (hence, a 6-year return cycle for monitoring in each watershed). In MORA, the survey will be conducted every year by the park and partners. Costs have been shared in the North Rainier herd survey flights since 1996 through formal agreements.

**Principal Investigators:** Patti Happe, Olympic National Park, Jim Schaberl, Mount Rainier National Park, Kurt Jenkins, USGS.

**Protocol Development Schedule, Budget, and Expected Interim Products**

**Protocol development schedule and products:**

- Principal investigators will develop a peer-reviewed monitoring protocol by March 2007 with few development costs associated.
- Additional Research and Development by USGS required in 2005/2006.

**Protocol development budget:**

The Principal Investigators will work with Data Management staff to write up the elk monitoring protocols; very few development costs will be associated with this effort.

**MOUNTAIN GOATS**

Mountain goat management is an important issue in national parks of the Pacific Northwestern U.S for several reasons, though the issues differ among NCCN parks. NCCN mountain parks are concerned about the health of subalpine and alpine systems – mountain goat abundance and distribution can help indicate community health and could help us better understand changes to these environs. Over the last few decades, mountain goat populations have declined substantially in many parts of their native range in Washington (Johnson 1983), raising concerns over the long-term persistence of the species in parts of the Cascades (Washington Department of Fish and Wildlife 2002). This decline has been particularly evident in the North Cascades Range including parts of North Cascades and Mount Rainier National Parks. While causes of these declines are poorly understood, assessing the magnitude of declines has been hampered by lack of quality data on population trends in the region.

In contrast to Mount Rainier and North Cascades where goats are a welcomed native species, mountain goats are an introduced species in Olympic National Park, where they are viewed as having the capacity to alter ecological integrity of subalpine ecosystems (Houston et al. 1994). Management efforts in Olympic National Park have focused on reducing or eliminating mountain goats to protect unique park ecosystems (Houston et al. 1991). A draft Environmental Impact Statement identified eradication of mountain goats as a cost-effective and feasible long-term solution to the problem (NPS 1995). Public

discussion of the proposal to eradicate mountain goats drew immense criticism from some segments of the public and resulted in congressional intervention in the planning process.

An unsubstantiated criticism of Olympic National Park's goat management program was that the National Park Service had inflated numbers of goats counted (Lyman 1998). In response to public criticism and congressional intervention in the NPS planning process, the Department of the Interior contracted with the Conservation Biology Institute, a private ecological consulting group, to conduct an independent review of scientific research on mountain goat populations and habitat effects in Olympic National Park. The review group concluded that mountain goat populations in the Park may have been overestimated inadvertently due to uncritical examination of detection biases (Noss et al. 2000). Calculating detection biases and developing a mountain goat monitoring protocol for MORA, NOCA, and OLYM parks are primary objectives in the multipark NRPP-Research project slated to begin in FY05.

**Monitoring Objective 2:** Determine trends in **mountain goat population distribution and relative abundance** in Mount Rainier, North Cascades, and Olympic National Parks

*What environmental resource will be monitored (target population)?*

We propose to monitor trends in counts of mountain goats observed during aerial surveys of high elevation subalpine and alpine habitat during the summer in 3 NCCN parks.

**Justification:** Goat population trends are one of the most direct and easily-gained metrics of population health. The areas were chosen because goats are most visible during these times of the year (before warmer temperatures change their sightability) in these habitats. Two parks have historical goat abundance data from aerial surveys.

*What will be measured (i.e., specifically the measurable attribute)?*

Raw counts of mountain goats observed from standard aerial survey protocols. A sampling protocol has been developed for OLYM than will be applied to NOCA and MORA. All three parks (OLYM, NOCA, and MORA) are currently working with Washington Department of Fish and Wildlife to develop protocols that adjust for sightability biases with corrective models.

*Where will it be monitored?*

Aerial surveys will be flown over defined "blocks" of high-elevation habitat (subalpine/alpine) of the three NCCN parks.

*How will it be measured?*

We will count all goats observed from a helicopter using revised survey methods that are calibrated in the NRPP-Research three-year research project. We will follow a stratified random sampling frame with strata based on H-M-L densities within survey blocks. Although OLYM survey blocks are already mapped, MORA and NOCA mountain goat habitat will be mapped in survey unit blocks. Block design allows a complete survey of a

block and reduces the likelihood of animal movement between blocks during a survey. The technique will be a helicopter flying approximately 200m above ground in parallel transects over each survey block.

*How frequently will it be monitored?*

Monitoring will occur on a rotating basis sampling each park every 4 years.

**Principal Investigators:** Kurt Jenkins, USGS, Jim Schaberl, Mount Rainier National Park, Patti Happe, Olympic National Park, Bob Kuntz, North Cascades National Park, and Cliff Rice –Washington Department of Fish and Wildlife.

### **Protocol Development, Schedule, and Expected Interim Products**

#### **Protocol development schedule and products:**

The NRPP-research project and protocol will be completed in FY07. Throughout this time period, additional partners and funding will be secured to continue the research through the fall of 2007. Monitoring corrected for detection bias could begin in the summer of 2008.

#### **Protocol development budget:**

<b>Cost Item</b>	<b>FY05</b>	<b>FY06</b>	<b>FY07</b>	<b>3-Year Total</b>
Term Biologist (GS-7/9, 5,6,6 Months)	14,000	21,000	23,110	
Biological Technician (GS-5, 4 Mo)	8,000			
GPS Collars @ 2,700 (8, 4, 2)	21,600	10,800	5400	
GPS Reciever @ 3,000	3,000			
VHF Radio-collars (10)		3,500		
Supplies and Equipment	3,000	1,000	1,000	
Helicopter Time (15, 25, 30 hrs)	10,500	17,500	21,000	
Fixed-Wing Aircraft (0, 25, 30 hrs)		2,875	3,500	
Travel	1000	3,000	4,500	
<b>Subtotal</b>	<b>61,100</b>	<b>59,875</b>	<b>58,510</b>	
USGS Indirect Costs (17%)	10,387	10,080	9,947	
<b>TOTAL</b>	<b>71,487</b>	<b>70,054</b>	<b>68,457</b>	<b>209,998</b>